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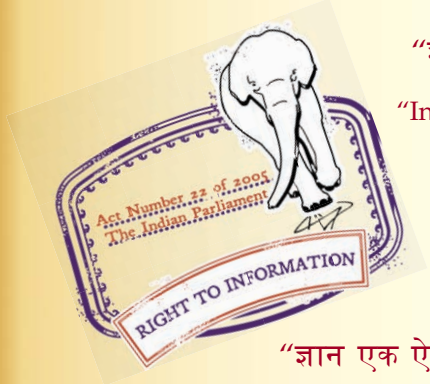
IS 12468 (1988): General requirements for vibrators for mass concreting; Immersion type [MED 18: Construction Plant and Machinery]



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"Knowledge is such a treasure which cannot be stolen"

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IS : 12468 - 1988
(Reaffirmed 2005)

Indian Standard

GENERAL REQUIREMENTS FOR VIBRATORS FOR MASS CONCRETING, IMMERSION TYPE

(Second Reprint OCTOBER 2007)

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BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

Gr 2

May 1989

Indian Standard

GENERAL REQUIREMENTS FOR VIBRATORS FOR MASS CONCRETING, IMMERSION TYPE

0. FOREWORD

0.1 This Indian Standard was adopted by the Bureau of Indian Standards on 29 July 1988, after the draft finalized by the Construction Plant and Machinery Sectional Committee had been approved by the Civil Engineering Division Council.

0.2 The compaction of concrete by vibration has revolutionized the concept of concrete technology, making possible use of low slump stiff mixes for production of high quality concrete with required degree of strength, density, durability and impermeability. Immersion vibrators are most commonly used for compaction of plain and reinforced concrete. With the introduction of centralized batching plant and mass concreting techniques, compaction of concreting by vibration by immersion vibrator up to 90 mm diameter has been found to be inadequate especially while taking into account the speed of pouring of concrete. In mass concreting, aggregates of size up to 150 mm is used. Effective compaction cannot be obtained with smaller diameter needles and as such it has become necessary to use bigger diameter needles. This standard is being prepared for giving guidance in the manufacture and use of immersion vibrators of needles of diameter over 90 mm. Immersion vibrators of 90 mm and below have already been covered in IS : 2505-1988*.

0.3 Pneumatic and electrically driven motor in head type immersion vibrators are to be advantageous for higher diameter immersion vibrators. Use of petrol/diesel engine prime mover has been found to be unsatisfactory in view of the weight due to higher horse power rating of the unit. For safety reasons, use of high frequency, low voltage electrical drive units are recommended for these vibrators.

0.4 For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS : 2-1960†. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

*General requirements for concrete vibrators, immersion type (*third revision*).

†Rules for rounding off numerical values (*revised*).

1. SCOPE

1.1 This standard lays down requirements for material, size, construction and performance of immersion vibrators above 90 mm size.

2. TERMINOLOGY

2.0 For the purpose of this standard, the definitions given in IS : 2505-1988* and the following shall apply.

2.1 Driving Shaft — A shaft which connects the motor and the eccentric shaft, and gives the drive to the eccentric shaft.

2.2 Driving Gear — A gear on the motor output shaft and the eccentric shaft.

2.3 Spindle Coupling — Coupling which connects the eccentric shaft and the motor gears through the spindle tube.

2.4 Spindle Tube — A tube which encloses the drive shaft.

2.5 Upper Eccentric Housing Cap — Cap which is on the driving end of the vibrator and connected to the spindle tube.

3. MATERIALS

3.1 The tube of the vibrating needle shall be seamless steel tube or heavy class ERW tube conforming to IS : 1161-1979* or IS : 1239 (Part 1)-1979†.

*General requirements for concrete vibrators, immersion type (*third revision*).

*Specification for steel tubes for structural purposes (*third revision*).

†Specification for mild steel tubes, tubulars and other wrought steel fittings: Part 1 Mild steel tubes (*fourth revision*).

3.2 The bottom cap shall be of carbon steel of grade 35C8 of IS : 1570 (Part 2)-1979* and shall be tempered and hardened to 40 to 50 HRC or cast steel conforming to grade 1 of IS : 1030-1982†.

3.3 The eccentric shaft/rotor shall be made of carbon steel of grade 35C8 of IS : 1570 (Part 2)-1979* and shall be tempered.

3.4 **Bearings** — The bearings shall be of ball bearing type of suitable capacity and conforming to relevant Indian Standards.

3.5 **Drive Shaft** — The drive shaft shall be seamless tube with end coupling of carbon steel with internal gear teeth for coupling to the eccentric shaft end and motor end.

3.6 **Handle** — It shall be of mild steel with rubber covering to suit the site requirements.

4. SIZES

4.1 The size of the vibrator shall be denoted by the outside diameter of the vibrating needle and expressed in mm.

4.1.1 The actual outside diameter of the needle measured anywhere in its length excluding the bottom cap and the top tube shall not differ from the outside diameter by more than ±2 mm.

4.1.2 The standard outside diameter of the vibrating needle shall be 100, 110 and 150 mm.

4.1.3 *Length of Vibrating Needle* — The length of vibrating needle shall be measured from the outer end of the bottom cap to the joint between the needle casing and the upper eccentric housing. Tolerance of the length shall be ± 5 mm.

NOTE — The following standard lengths are recommended for selection of suitable length depending upon the nature of jobs required. These sizes have been recommended arbitrarily, purely with a view to aiding rationalized production by limiting a number of sizes of 600, 625 and 650 mm.

5. CONSTRUCTION

5.1 Vibrating Needle

5.1.1 *Tube* — The tube should be reinforced at the threaded portion as indicated in Fig. 1 to prevent any failure due to lesser thickness at this point. Suitable bearing blocks have to be welded inside the tube for mounting the bearings of the eccentric shaft. This is necessary because the outer diameter of the bearings of the required capacity may be less than the inside diameter of the needle casing (*see* Fig. 1).

5.1.2 *Bearings* — These shall be of adequate size, and suitably mounted and press fitted on the shaft so as to take both radial and axial loads. The bearings and the eccentric shaft assembly shall be such as to enable the removal of shaft for repairs and replacement.

5.1.3 *Concentricity* — The eccentric shaft or rotor upon assembly shall be such that all components are concentric about their respective centre lines where bearing, journals, housing and drive shaft, etc, are concerned.

5.1.4 *Vibrating Needle* — It shall be completely sealed against entry of moisture, dust, grout, etc.

6. PERFORMANCE REQUIREMENTS

6.1 It shall be in accordance with IS : 2505-1988*

*Schedules for wrought steels for general engineering purposes: Part 2 Carbon steels (unalloyed steels) (*first revision*).

†Specification for carbon steel castings for general engineering purposes (*third revision*).

*General requirements for concrete vibrators, immersion type (*third revision*).

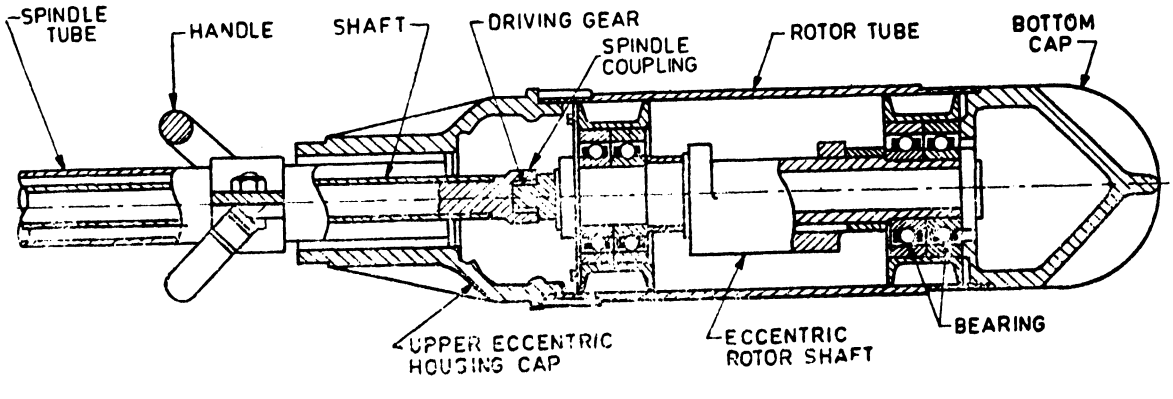

FIG. 1 HEAVY DUTY VIBRATOR

excepting that the frequency of vibration and amplitude should be as follows:

Diameter of Vibrating Needle (mm)	*Frequency* (Vibrations/minute)	*Amplitude* (mm)
100 110 150	5 500-8 500	2-1

6.1.1 The normal recommended life of unit is 5000 h except for the wearing parts.

7. INSTRUCTION SHEET

7.1 An instruction sheet containing instructions relating to installation, maintenance and lubrication of the vibrator and prime mover shall be given.

8. MARKING

8.1 Each vibrator shall have firmly attached to it a mark plate bearing the following information:

a) Manufacturer's name or trade-mark;

b) Vibrator reference number;

c) Type and rating of the power unit to be used;

d) Year of manufacture; and

e) Frequency and amplitude.

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Amendments Issued Since Publication

Amend No.	Date of Issue	Text Affected

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